Name: Date:

Polynomial Factoring solution (version 651)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 10x + 43 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(43)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 172}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-72}}{2}$$

$$x = \frac{-10 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{-10 \pm 6\sqrt{2}\, i}{2}$$

$$x = -5 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-8 + 4i$ and $-3 - 6i$ in standard form $(a + bi)$.**

Solution

$$(-8 + 4i) \cdot (-3 - 6i)$$

$$24 + 48i - 12i - 24i^2$$

$$24 + 48i - 12i + 24$$

$$24 + 24 + 48i - 12i$$

$$48 + 36i$$

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3. **Write function $f(x) = x^3 + 7x^2 + 7x - 15$ in factored form. I'll give you a hint: one factor is $(x + 3)$.**

Solution

	1	7	7	-15
-3		-3	-12	15
	1	4	-5	0

$$f(x) = (x+3)(x^2+4x-5)$$

$$f(x) = (x+3)(x+5)(x-1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+4)^2 \cdot (x-1) \cdot (x-4)^2 \cdot (x-8)$$

Sketch a graph of polynomial $y = p(x)$.